Patent claims:

1. Method for the holding in flotation of a substance (73), in particular of a tissue part, in a bioreactor (61), characterized in that the substance (73) is acted upon with a fluid; and in that the flow of the fluid acts counter to gravity or to buoyancy in such a manner that the substance (73) is held in suspension.

2. Method in accordance with claim 1, characterized in that the fluid has an increasingly lower flow speed in the direction counter to the gravitational force or to the buoyancy force.

3. Method in accordance with claim 1 or claim 2, characterized in that the substance (73) is acted upon with at least one fluid jet.

4. Method in accordance with any one of the preceding claims, characterized in that the position of the substance (73) in the bioreactor (61) is measured by a sensor (85); and in that the speed of the fluid in the bioreactor (61) is regulated in dependence on the position of the substance (73) in such a manner that the substance (73) is held in flotation in a predetermined position.

5. Method in accordance with any one of the preceding claims, characterized in that a downward flow of the fluid which flows in the direction of gravitation is produced in the bioreactor (61) in addition; and in that a gaseous fluid, in particular air or oxygen, is led in into this downwardly flowing fluid.

6. Method in accordance with claim 5, characterized in that the flow speed of the downwardly flowing fluid is chosen such that the gaseous fluid which is led in is slowed down or even does not rise.

7. Bioreactor (61) comprising a container (62) for a substance (73) which is to be acted upon with fluid, comprising a first flow chamber (66a) to which a flowing fluid can be supplied, with the first flow chamber (66a) being designed such that the fluid flowing upwardly therein has a lower speed with increasing height.

8. Bioreactor (61) comprising a container (62) for a substance (73) to be acted upon with fluid, comprising a first flow chamber (66a) to which a flowing fluid can be supplied, and comprising a sensor (85) which is arranged and designed in such a manner that the position of the substance (73) acted upon in the first flow chamber (66a) is measurable, and comprising a fluid conveying apparatus (74) which is connected in a fluid guiding manner to the first flow chamber (66a), and comprising a regulation apparatus (86) which is connected to the sensor (85) and to the fluid conveying apparatus (74) in a signal guiding manner.

9. Bioreactor (61) in accordance with claim 7 or claim 8, characterized in that the first flow chamber (66a) is designed to widen upwardly.

10. Bioreactor (61) in accordance with claim 9, characterized in that the container (62) has a section (62f) with a container wall (62d)

which widens upwardly; and in that this section (62f) forms the first flow chamber (66a).

11. Bioreactor (61) in accordance with any one of the claims 7 to 10, characterized in that at least one fluid line (76b) opens into the first flow chamber (66a), preferably from below or arranged laterally with respect to the flow chamber (66a).

12. Bioreactor (61) in accordance with any one of the claims 7 to 11, characterized in that at least one fluid guiding means (66) is arranged in the container (62) which forms the first flow chamber (66a), with the fluid guiding means (66) being designed such that the first flow chamber (66a) widens upwardly.

13. Bioreactor (61) in accordance with claim 12, characterized in that the fluid guiding means (66) is designed as a hollow body (66b).

14. Bioreactor (61) in accordance with claim 13, characterized in that the hollow body (66b) has an inner space which widens upwardly and which forms the first flow chamber (66a).

15. Bioreactor (61) in accordance with claim 13, characterized in that the hollow body (66b) has an upwardly reducing outer contour (66c); and in that the hollow body (66b) is arranged in the container (62) in such a manner that the first flow chamber (66a), which widens upwardly, is formed between the outer contour (66c) and the container wall (62d).

16. Bioreactor (61) in accordance with any one of the claims 13 to 15, characterized in that the hollow body (66b) is formed in the shape of truncated circular cone.

17. Bioreactor (61) in accordance with any one of the claims 7 to 16, characterized in that the container (62) has at least one closeable opening (62c) above.

18. Bioreactor (61) in accordance with claim 17, characterized in that the closeable opening (62c) has a surface of at least one fourth the cross-sectional area of the container (62).

19. Bioreactor (61) in accordance with any one of the claims 17 or 18, characterized in that the closeable opening (62c) is arranged above the first flow chamber (66a).

20. Bioreactor (61) in accordance with any one of the claims 7 to 19, characterized in that the fluid conveying apparatus (65) is arranged outside the container (62) and is connected in a fluid guiding manner via lines (70, 71) to the container (62).

21. Bioreactor (61) in accordance with any one of the claims 7 to 19, characterized in that the fluid conveying apparatus (65) comprises a fluid conveying means (65c), in particular a vaned wheel; and in that the fluid conveying means (65c) is arranged inside the container (62).

22. Bioreactor (61) in accordance with claim 21, characterized in that the fluid conveying apparatus (65) comprises an electric motor

having a static motor part (65a) and a rotatable motor part (65b), with the rotatable motor part (65b) being arranged inside the container (62) and the fluid conveying means (65c) being connected to the rotatable motor part (65b).

23. Bioreactor (61) in accordance with claim 22, characterized in that the electric motor is designed as a split tube motor.

24. Bioreactor (61) in accordance with claim 22 or claim 23, characterized in that the fluid conveying apparatus (65) comprises a magnetic coupling drive which is designed to be adapted for coupling to the rotatable motor part (65b).

25. Bioreactor (61) in accordance with claim 22 or claim 23, characterized in that the rotatable motor part (65b) of the electric motor is journalled at least with respect to one degree of freedom with actively or passively magnetically acting means.

26. Bioreactor (61) in accordance with claim 25, characterized in that the static and rotatable motor part (65a, 65b) are designed to be mutually matched in such a manner that the rotatable motor part (65b) is completely magnetically journalled.

27. Bioreactor (61) in accordance with anyone of the preceding claims, characterized in that a second flow chamber (66f) is arranged above the first flow chamber (66a) and is designed in such a way that the fluid flowing from the top to the bottom therein has a smaller speed with decreasing height.

28. Bioreactor (61) in accordance with claim 27, characterized in that the first flow chamber and the second flow chamber (66a, 66f) form a common inner space which has an inlet opening (66d) for the fluid at the top and at the bottom and which has an outlet opening (66e) between the upper and lower inlet opening (66d).

29. Bioreactor (61) in accordance with claim 28, characterized in that the outlet opening (66e) is connected in fluid conducting manner to a pump (74), in that the pump (74) is connectable in fluid conducting manner to the upper and lower inlet opening (66d) and in that the quantity of fluid flowing into the upper and/or lower inlet opening (66d) can be controlled.